

CLAIMS

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61* 1. A cut-resistant yarn suitable for machine knitting, comprising a core, a first wrapping about the core and a second wrapping about the first, at least one of said core, first wrapping and second wrapping being comprised of liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier.

2. A cut-resistant yarn as set forth in claim 1 wherein the core is comprised of said liquid crystal polymer fiber.

3. A cut-resistant yarn as set forth in claim 1 wherein the first wrapping is comprised of said liquid crystal polymer fiber.

4. A cut-resistant yarn as set forth in claim 1 wherein the second wrapping is comprised of said liquid crystal polymer fiber.

5. A cut-resistant yarn as set forth in claim 2 wherein one of the first and second wrappings is comprised of synthetic fiber having a tenacity no greater than 10 grams per denier.

6. A cut-resistant yarn as set forth in claim 5 wherein said synthetic fiber of said one wrapping is said liquid crystal polymer fiber.

7. A cut-resistant yarn as set forth in claim 5 wherein one of the first and second wrappings is comprised of synthetic fiber having a tenacity greater than 10 grams per denier.

8. A cut-resistant yarn as set forth in claim 1 wherein one of the first and second wrappings is comprised of synthetic fiber having a tenacity greater than 10 grams per denier.

9. A cut-resistant yarn as set forth in claim 1 wherein one of the first and second wrappings is comprised of synthetic fiber having a tenacity greater than 20 grams per denier.

10. A cut-resistant yarn as set forth in claim 2 wherein one of the first and second wrappings is comprised of synthetic fiber having a tenacity greater than 10 grams per denier.

11. A cut-resistant yarn as set forth in any one of claims 1-10, including a flexible metal strand having a diameter of from 0.001 to 0.010 inch.

12. A cut-resistant yarn as set forth in claim 11 wherein the metal strand is a core element.

13. A cut-resistant yarn as set forth in claim 11 wherein the metal strand is a wrapping.

14. A cut-resistant yarn as set forth in claim 13 including a second flexible metal strand as a wrapping.

15. A cut-resistant yarn as set forth in any one claims 1, 3, 4, 8 or 9 wherein a flexible metal strand and a fiber strand comprise the core.

16. A cut-resistant yarn as set forth in claim 11 wherein the flexible metal strand is annealed stainless steel.

17. A cut-resistant yarn suitable for machine knitting having: a core comprised of a liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier; a flexible metal strand; a wrapping of liquid crystal polymer fiber having a tenacity of no more than

10 grams per denier, and one or more additional wrappings of synthetic fiber none of which has a tenacity greater than 10 grams per denier.

18. A cut-resistant yarn as set forth in claim 17 wherein the metal strand is annealed stainless steel of a diameter from 0.001 to 0.006 inch, the liquid crystal polymer fiber of the core and wrapping each has a denier of from 200 to 3000, and each of the one or more additional wrappings of synthetic fiber has a denier of from 200 to 1500.

19. A cut-resistant yarn as set forth in claim 17 or 18 wherein the metal strand is a wrapping.

20. A cut-resistant yarn suitable for machine knitting having a core comprised of synthetic fiber, means bundling the core fiber, a wrapping of wire about the bundled core, and two wrappings of synthetic fiber each wound in an opposite direction over the wrapping of wire, said synthetic fiber of one of said synthetic fiber wrappings and core or both being a liquid crystal polymer having a tenacity of no more than 10 grams per denier.

21. A cut-resistant yarn as set forth in claim 20 wherein said synthetic fiber of which the core is

comprised is a liquid crystal polymer having a tenacity of no more than 10 grams per denier and a denier of from 200 to 3000, said means bundling the core fiber comprises two wraps of fiber having a denier of from 70 to 120, said wrapping of wire comprises a strand of stainless steel having a diameter of from 0.001 to 0.006 inch, and one of said two wrappings of synthetic fiber is a liquid crystal polymer having a tenacity of no more than 10 grams per denier and a denier of from 200 to 1500.

22. A cut-resistant yarn as set forth in claim 21 wherein the other of said two wrappings of synthetic fiber is nylon or polyester having a denier of from 200 to 1500.

23. A cut-resistant yarn suitable for machine knitting having a core comprising a liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier, a wrapping of wire about the core, and two wrappings of synthetic fiber over the wire, each of said two wrappings being wound in an opposite direction from the other and selected from the group consisting of liquid crystal polymer, aramid, high strength stretched polyethylene, polyester, and nylon.

24. A cut-resistant yarn as set forth in claim 23 wherein a first of said two wrappings wound over the wire is a liquid crystal polymer having a tenacity of no more than 10 grams per denier and a denier of from 200 to 1500, and a second of said two wrappings is nylon or polyester having a denier of from 200 to 1500.

25. A cut-resistant yarn suitable for machine knitting having a core comprised of a liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier and a strand of wire, and having wrappings comprised of a wrapping of liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier, and two wrappings each of which is either nylon or polyester over the liquid crystal polymer wrapping.

26. A cut-resistant yarn as set forth in claim 25 wherein the strand of wire is stainless steel having a diameter of from 0.001 to 0.006, the liquid crystal polymer fiber of the core and of the wrapping have a denier of from 200 to 3000, and each of the said two wrappings has a denier of from 200 to 1500.

27. A cut-resistant yarn suitable for machine knitting comprising a core having glass fiber, and wrappings about the core, one of said wrappings comprising a liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier.

28. A cut-resistant yarn as set forth in claim 27 wherein the glass fiber has a denier of from 400 to 1500, two wrappings are of said liquid crystal polymer, and a third wrapping is polyester or nylon, said wrappings each having a denier of from 200 to 1500.

29. A cut-resistant yarn suitable for machine knitting, comprising:

(a) a 200 to 2000 denier core comprised of synthetic fibers;

(b) means retaining the core fibers in a bundle;

(c) a wrapping having a maximum diameter of 0.010 inch of material selected from the group consisting of metal wire and glass fiber, two to twelve turns per inch, disposed about the core and said means;

(d) a wrapping of 200 to 3000 denier liquid crystal polymer fiber having a tenacity of no more than 10 grams per denier disposed about said material wrapping, with turns directly adjacent each other; and

(e) another wrapping of 200 to 2000 denier synthetic

fiber disposed about the first-mentioned wrap of synthetic fiber, with turns directly adjacent each other.

30. A cut-resistant yarn as set forth in claim 29 wherein the means retaining the core fibers in a bundle comprises two wrappings of synthetic fiber each having a denier of at least 50 and wrapped directly about the core fibers at least two turns per inch.

31. A cut-resistant yarn as set forth in claim 29 or 30 wherein none of the said synthetic fibers has a tenacity of more than 10 grams per denier.

32. A cut-resistant yarn as set forth in claim 2 wherein the core fiber is formed of from 1 to 50 filaments.

33. A cut-resistant yarn as set forth in claim 32 wherein the core is wire-free and each core filament has a denier of from 10 to 500.

34. A cut-resistant yarn set forth in claim 20 wherein an outer wrapping is of microdenier nylon.

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~~35. A yarn as set forth in any one of claims 1-34, knitted to form an article of protective apparel.~~

36. A yarn as set forth in claim 35 wherein the article is a cut-resistant protective glove.